

FINAL REPORT  
JUNE 1994

REPORT NO. 94-20

STINGER MISSILE  
EXTERNAL AERIAL  
TRANSPORT (EAT)  
CERTIFICATION

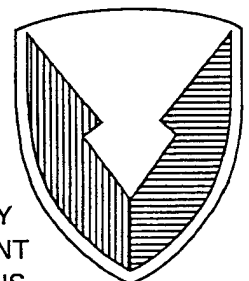
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20 JUN 1995

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SUBJECT: STINGER Missile External Aerial Transport (EAT) Certification

1. Enclosed is the U.S. Army Defense Ammunition Center and School (USADACS) Report No. 94-20.

2. The POC is Mr. Quinn D. Hartman, SMCAC-DEV, DSN 585-8992, commercial (815) 273-8992.

FOR THE DIRECTOR:

Encl  
as

  
JEROME H. KROHN  
Chief, Validation Engineering Division

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1a. REPORT SECURITY CLASSIFICATION <b>UNCLASSIFIED</b>			1b. RESTRICTIVE MARKINGS		
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2b. DECLASSIFICATION / DOWNGRADING SCHEDULE					
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17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)		
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19. ABSTRACT (Continue on reverse if necessary and identify by block number) <p>The U.S. Army Defense Ammunition Center and School (USADACS), Validation Engineering Division (SMCAC-DEV), was tasked by the U.S. Army Armament Research, Development and Engineering Center (ARDEC) to conduct a static pull test on the STINGER missile pallet as part of the helicopter External Aerial Transport (EAT) certification process. As prescribed by MIL-STD-209, Military Standard Slings and Tiedown Provisions for Lifting and Tying Down Military Equipment, the pallet was loaded to 4,200 pounds for a period of 90 seconds utilizing a four-legged sling. The first article pallet initially tested was noted to have minor permanent deformation in the toplift frame upon completion of the test. Since no permanent deformation is allowed, the first article pallet was determined to have failed the MIL-STD-209 static pull test. A second pallet toplift frame was constructed substituting 10 gauge metal for 12 gauge metal. The lift test was repeated with the new toplift frame on the pallet. Upon completion of the test, the pallet was inspected and determined to have sustained no permanent deformation as a (continued)</p>					
20. DISTRIBUTION / AVAILABILITY OF ABSTRACT <input checked="" type="checkbox"/> UNCLASSIFIED/UNLIMITED <input type="checkbox"/> SAME AS RPT. <input type="checkbox"/> DTIC USERS			21. ABSTRACT SECURITY CLASSIFICATION <b>UNCLASSIFIED</b>		
22a. NAME OF RESPONSIBLE INDIVIDUAL <b>JEROME H. KROHN</b>			22b. TELEPHONE (Include Area Code) <b>815-273-8929</b>		22c. OFFICE SYMBOL <b>SMCAC-DEV</b>

# 19. ABSTRACT (continued)

result of the static load. Having successfully passed MIL-STD-209 requirements, the STINGER missile pallet was transported to U.S. Army Combat Systems Test Activity (USACSTA) for helicopter flight testing.

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U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL  
VALIDATION ENGINEERING DIVISION  
SAVANNA, IL 61074-9639

REPORT NO. 94-20

STINGER MISSILE EXTERNAL AERIAL TRANSPORTATION (EAT) CERTIFICATION

JUNE 1994

TABLE OF CONTENTS

PART	PAGE NO.
1. INTRODUCTION .....	1-1
A. BACKGROUND .....	1-1
B. AUTHORITY .....	1-1
C. OBJECTIVE .....	1-1
D. CONCLUSION .....	1-1
2. ATTENDEES .....	2-1
3. TEST PROCEDURES .....	3-1
4. TEST RESULTS .....	4-1
5. PHOTOGRAPH .....	5-1
6. DRAWINGS .....	6-1

## PART 1

### INTRODUCTION

A. BACKGROUND. The U.S. Army Defense Ammunition Center and School (USADACS), Validation Engineering Division (SMCAC-DEV), was tasked by the U.S. Army Armament Research, Development and Engineering Center (ARDEC) to conduct a static pull test on the STINGER missile pallet as part of the helicopter External Aerial Transport (EAT) certification process. Testing was conducted IAW MIL-STD-209, Military Standard Slings and Tiedown Provisions for Lifting and Tying Down Military Equipment.

B. AUTHORITY. The test was accomplished IAW mission responsibilities delegated by the U.S. Army Armament, Munitions and Chemical Command (AMCCOM), Rock Island, Illinois. Reference is made to the following:

1. Change 4, 4 October 1974, to AR740-1, 23 April 1973, Storage and Supply Activity Operation.

2. AMCCOM-R 10-17, Mission and Major Functions of USADACS, 13 January 1986.

C. OBJECTIVE. The purpose of this test was to determine if the toplift frame and strapping configuration of the pallet was sufficient to withstand the rigors associated with EAT prior to flight testing.

D. CONCLUSION. Following successful completion of MIL-STD-209 requirements, the modified STINGER missile pallet was determined to be suitable for helicopter flight testing. The STINGER missile pallet was forwarded to U.S. Army Combat Systems Test Activity (USACSTA) for helicopter flight testing.

PART 2

23 MAY AND 17 JUNE 1994

ATTENDEES

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## PART 3

### TEST PROCEDURES

As part of the External Aerial Transport (EAT) certification procedure, a static load of 4,200 pounds was applied to the STINGER missile pallet IAW MIL-STD-209. Prior to testing, the 1,200-pound pallet was secured to an M872 semitrailer utilizing two 1-1/4-inch metal bands over the top of the second layer of missile containers (see part 5). A 50,000-pound-capacity container handler was connected to the pallet utilizing a four-legged sling appropriate for helicopter slinging. The pallet was then pulled to the design limit load (3.5 times the pallet weight) for a period of 90 seconds. During the pull, the static load was monitored with a 5,000-pound-capacity dynamometer. Upon completion of the test, the pallet was inspected for damage due to the static load.

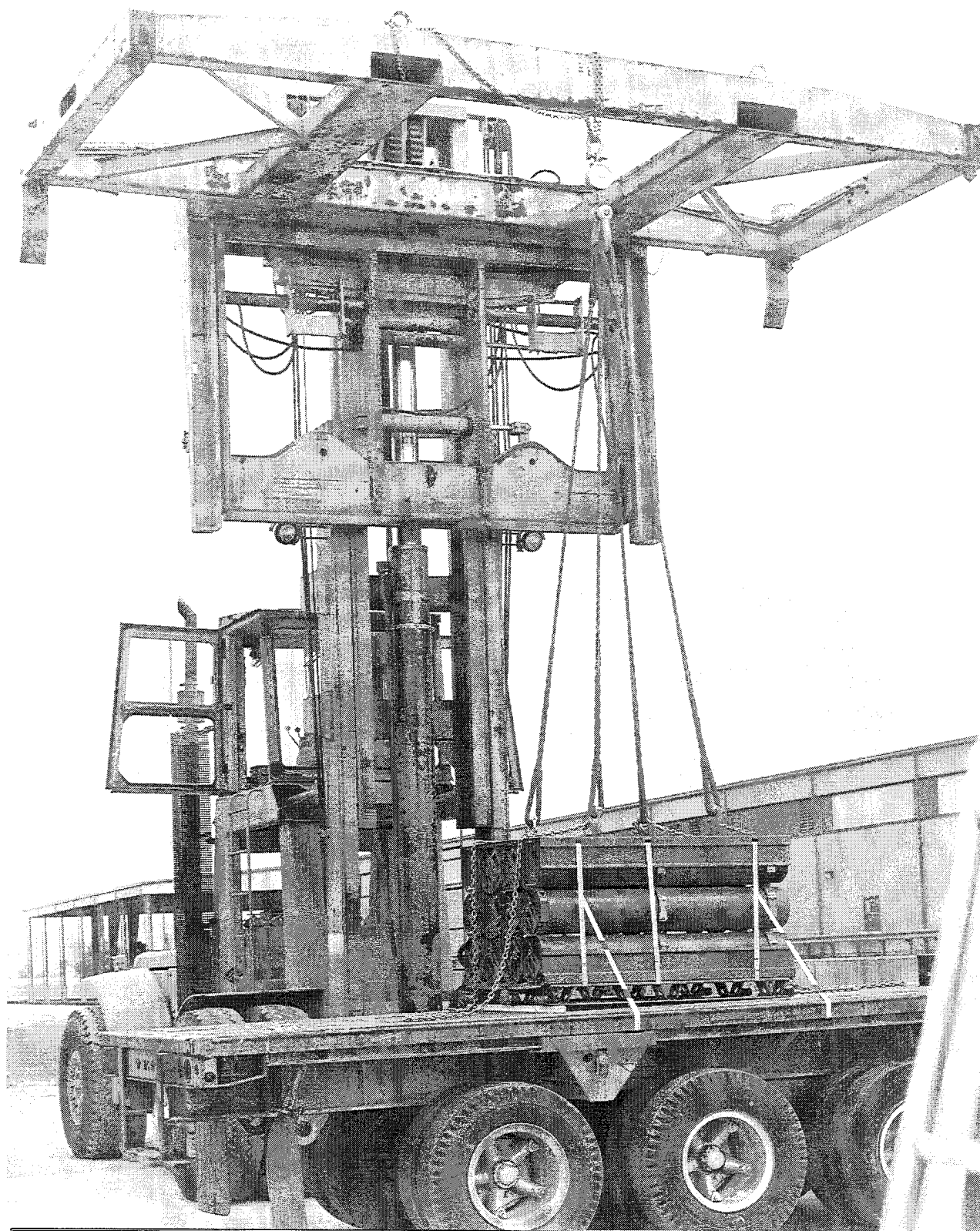
## PART 4

### TEST RESULTS

Upon completion of MIL-STD-209 testing, the STINGER missile pallet was inspected for damage from the static loading. The first article pallet that was initially tested was noted to have minor permanent deformation in the toplift frame. Since no permanent deformation is allowed, the first article pallet was determined to have failed the MIL-STD-209 static pull test. A second pallet toplift frame was then constructed substituting 10 gauge metal for 12 gauge metal. The lift test was repeated with the new toplift frame on the pallet. Upon completion of this test, the pallet was inspected and determined to have sustained no permanent deformation as a result of the static load. Metal strapping used to unitize the pallet was also determined to have sustained no damage as a result of the static loading.

PART 5

PHOTOGRAPH



	U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL - SAVANNA, IL	
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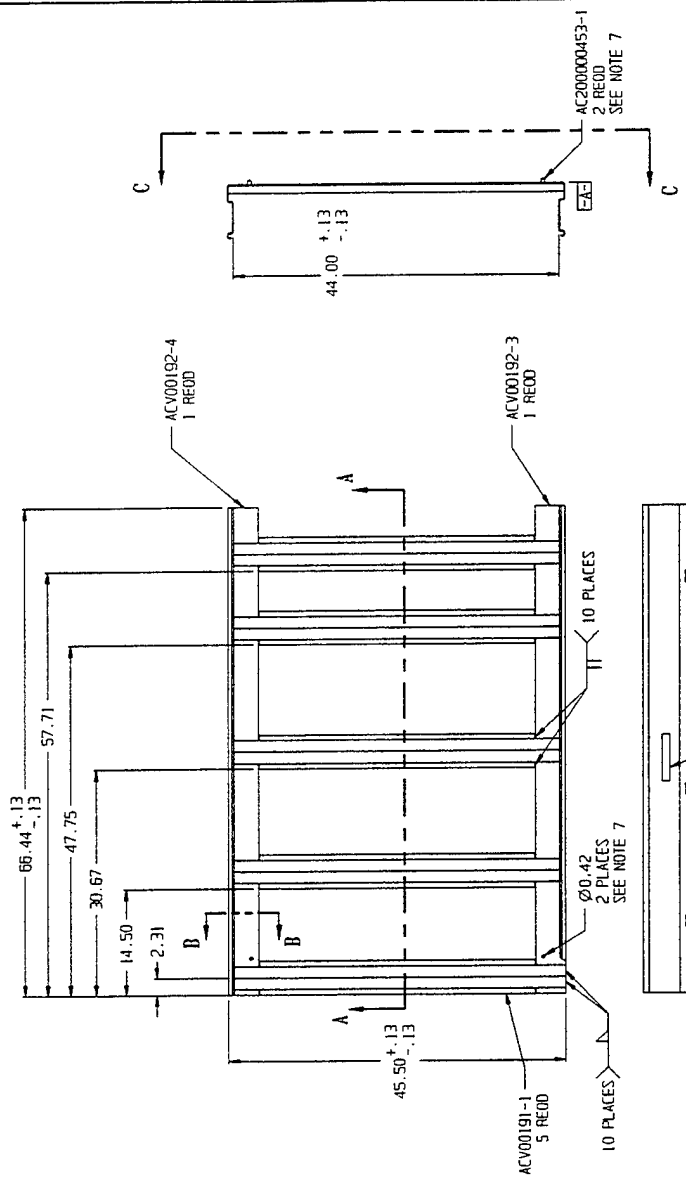
Photo No. AO317-SCN94-160-2378: This photo shows the STINGER missile pallet attached to the M872 semitrailer during MIL-STD-209 static pull testing.
---------------------------------------------------------------------------------------------------------------------------------------------------------

PART 6

DRAWINGS



- NOTES:
1. MIL-A-2550, ANSI/AWS A2.4-86, ANSI Y14.5M-1982 AND MIL-A-71179, APPLY.
  2. PROTECTIVE FINISH SHALL BE IN ACCORDANCE WITH DWG AC200000423. COLOR SHALL BE GREEN NO 383 PER MIL-C-46168 (FED STD 595 NO 3409B).
  3. MARKING PAINT SHALL BE IN ACCORDANCE WITH DWG AC200000423. COLOR SHALL BE WHITE NO 37875 0.50 INCH HIGH LETTERS.
  4. WELDMENT CONSTRUCTION SPEC MIL-STD-1281 APPLIES.
  5. DIMENSIONS OF THE RETAINER RING MAY BE VARYED TO INSURE THE RING'S POSITION WHEN LIFTED VERTICALLY. THIS DIMENSION ASSURES 75 AND 85 DEGREES WITH THE HORIZONTAL. THIS DIMENSION ASSURES THAT THE RING SHALL BE SELF NESTING WHEN NOT IN USE.
  6. CHAMFERED CORNER SHALL NOT BE WELDED IN ORDER TO ALLOW ADDITIONAL DRAIN HOLE.
  7. ALTERNATE ALIGNING LUG PART NO AC200000453-3 MAY BE USED INSTEAD OF PART NO AC200000453-1. IF ALTERNATE LUG IS USED, USE Ø0.52 2 PLACES.



SECTION A-A  
SOME HIDDEN LINES OMITTED FOR CLARITY

PART NO ACV00194

DESIGN ACTIVITY		U.S. ARMY ARMED FORCES ENGINEERING CENTER FORT BELVOIR, VIRGINIA 22060-5000	
DATE	93-04-20	BY	BJK SHS SCHULTZ
DESIGNED BY	BJK SHS SCHULTZ	CHECKED BY	BJK SHS SCHULTZ
APPROVED BY		DATE	93-04-20
TOP ASSEMBLY PALLET ADAPTER		SIZE D 28820	
PART NO ACV00194		SCALE 1/8" = 1" UNIT WT	
APPLICATION		SHEET 1 OF 2	





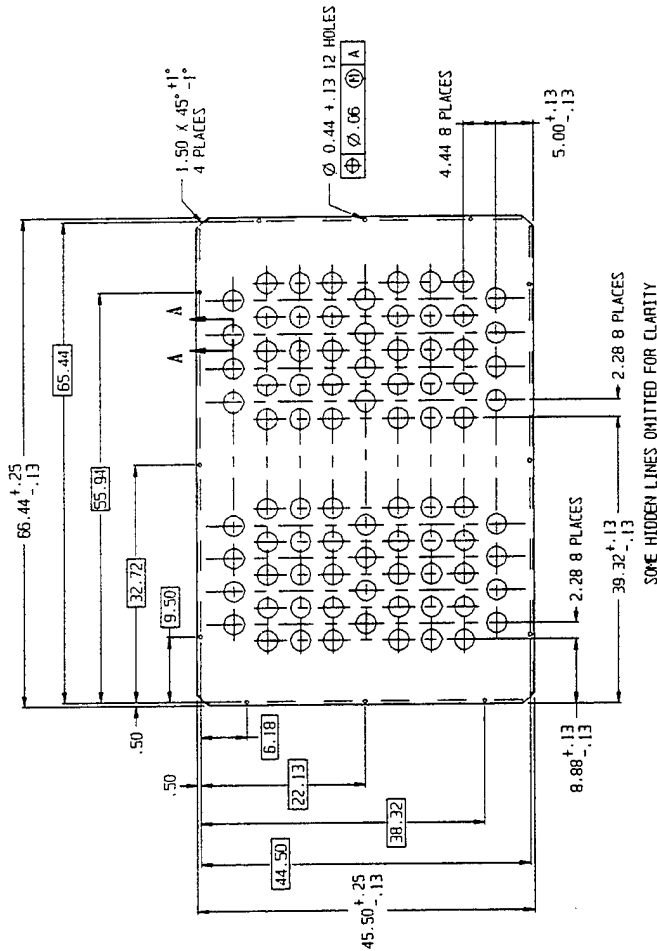
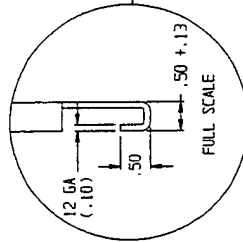
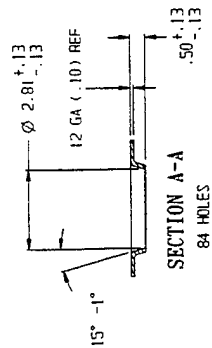








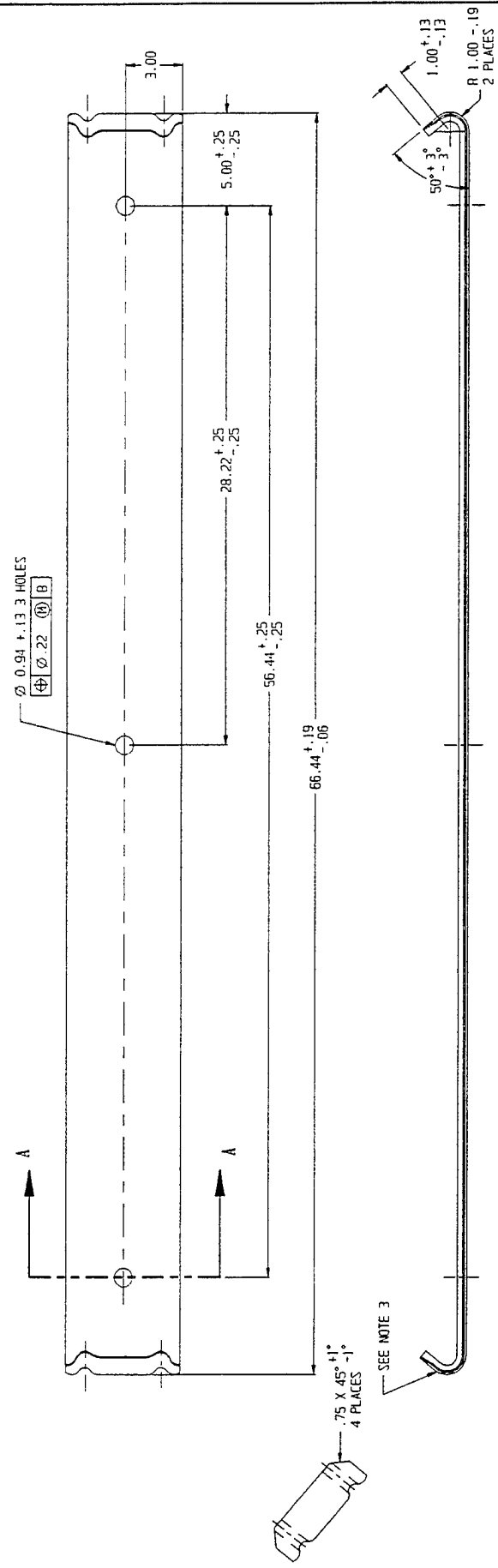
- NOTES:
1. BEND RADIUS 0.13 INCH MAX WHERE NOT NOTED.
  2. SPEC ANSI Y14.5M-1982 APPLIES.
  3. MATERIAL: SHEET, SAE OR ANSI 1005-1010 STEEL, CARBON, COLD ROLL OR HOT ROLL, PER ASTM A568, (ASTM A366 OR A569).



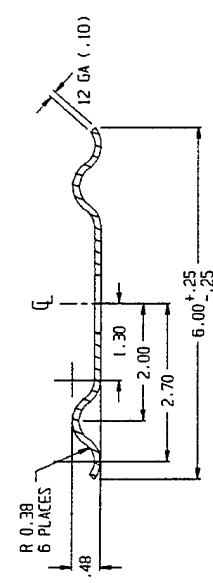
PART NO ACV00197

DESIGN ACTIVITY	U.S. ARMY ARMED FORCES ENGINEERING CENTER SANDIA, ALBUQUERQUE, NEW MEXICO TLLT001 8074-0039
DATE	93-04-20
DESIGNER	BJK
CHECKER	SMS
APPROVER	SCHULTZ
DESIGN TITLE	DECK- PALLET, SPECIAL SIZE 66.44 X 45.50 SHEET METAL
SIZE	D
SCALE	1/8
UNIT	WT
SHEET	1 OF 1

- NOTES:
1. SPEC ANSI Y14.5-1982M APPLIES.
  2. MATERIAL: SHEET, SAE OR ANSI 1005-1010 STEEL, CARBON, COLD ROLL OR HOT ROLL, PER ASTM A568 (ASTM A366 OR A569).
  3. DISTORTION IN THE BEND IS PERMISSIBLE.



HIDDEN LINES OMITTED FOR CLARITY

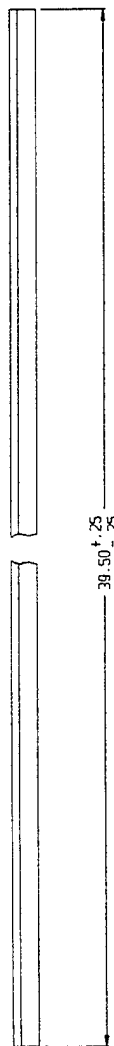
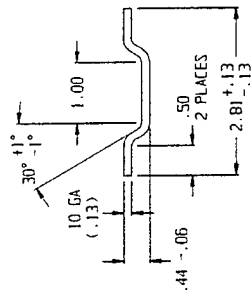


SECTION A-A  
SCALE 1/1

PART NO ACV00198

DESIGN ACTIVITY		U.S. ARMY	
APPROPRIATE MAINTENANCE AND OPERATIONAL CONSIDERATIONS		SILVERDALE, ILLINOIS 61074-9035	
DESIGNER		SKID	
CHECKER		PALLET, SHEET METAL	
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TESTED BY		SCALE 3/8"	
DATE		UNIT WT	
93-04-20		SHEET 1 OF 1	
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- NOTES:
1. BEND RADIUS 0.13 INCH MAX WHERE NOT NOTED.
  2. SPEC ANSI Y14.5-1982M APPLIES.
  3. MATERIAL: SHEET, SAE OR ANSI 1005-1010 STEEL, CARBON, COLD ROLL OR HOT ROLL, PER ASTM A568, (ASTM A366 OR A569).



PART NO ACV00199

U.S. ARMY MILITARY ACTIVITY STIFFENER - PALLET, SHEET METAL		DATE: 93-04-20 DESIGNED BY: BJK CHECKED BY: SMS DRAWN BY: SCHULTZ		U.S. ARMY MILITARY ACTIVITY STIFFENER - PALLET, SHEET METAL	
TITLE: STIFFENER - PALLET, SHEET METAL SCALE: 1/1 UNIT: IN		SIZE: D D: 28820 SCALE: 1/1 UNIT: IN		U.S. ARMY MILITARY ACTIVITY STIFFENER - PALLET, SHEET METAL	
APPLICATION: STIFFENER - PALLET, SHEET METAL		APPLICATION: STIFFENER - PALLET, SHEET METAL		U.S. ARMY MILITARY ACTIVITY STIFFENER - PALLET, SHEET METAL	